



**west virginia** department of environmental protection

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**ENGINEERING EVALUATION / FACT SHEET**

BACKGROUND INFORMATION

Application No.:	R13-3002C
Plant ID No.:	085-00023
Applicant:	Antero Midstream LLC (Antero)
Facility Name:	White Oak Compressor Station
Location:	Pullman, Ritchie County
NAICS Code:	221210 (Natural Gas Distribution)
Application Type:	Class II Administrative Update
Received Date:	April 26, 2017
Engineer Assigned:	Jerry Williams, P.E.
Fee Amount:	\$300.00
Date Received:	April 26, 2017
Complete Date:	May 15, 2017
Due Date:	July 14, 2017
Applicant Ad Date	May 3, 2017
Newspaper:	<i>The Pennsboro News</i>
UTM's:	Easting: 509.781 km      Northing: 4,338.144 km      Zone: 17
Description:	Increase in the number of compressor blowdown and startup events.

DESCRIPTION OF PROCESS

The White Oak Compressor Station is located in Ritchie County, approximately 1.2 miles northeast of White Oak. This facility began operation in March 2013 upon issuance of Permit R13-3002.

The following process description was taken from Permit Application R13-3002C:

The White Oak Compressor Station is located in Ritchie County, West Virginia. Gas from surrounding pipelines enters the facility through one (1) receiver and associated slug catcher. From there, the gas is metered and routed through a scrubber and filter separator. Any produced liquids from the scrubber or separator are sent to the 400 barrel settling tank (T03). Gas from the filter separator is sent to one (1) of eleven (11) 1,680 hp Waukesha compressor engines (CE-01 – CE-11). The eleven (11) compressor engines are controlled with NSCR catalysts and air-fuel

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ratio controllers (C02-C06, C09-C14). Fuel gas for the compressor engines will be treated prior to the engines by a fuel conditioning skid with a 0.5 MMBtu/hr heater (FUEL1) to allow more complete combustion. Produced fluids are routed to the settling tank and gas going to one of the two (2) TEG dehydrators.

Each TEG dehydrator contains a still vent, flash tank (RSV-1, RSV-2), and 1.5 MMBtu/hr reboiler (RBV1, RBV-2). Each dehydrator has a design rate of 110 MMscf/day. Within the dehydrator unit, vent gas from the flash gas tank is routed to the reboiler (RBV-1, RBV-2) and used as fuel. In the case where the flash tank gas cannot be used by the reboiler due to excess gas or the reboiler is offline, the gas will be sent to the vapor recovery units (C-07, C-08) via the storage tanks and thus controlled by 98%. Combustion emissions from each reboiler are routed to the atmosphere. The dehydrator still vents are controlled by a flare with at least 98% control efficiency (C-01). Produced fluids from the dehydrator are routed to the settling tank. The dry gas from the dehydration process is either routed to a fuel gas scrubber, metered, and routed to the compressors as fuel gas or metered and sent to plant discharge.

All produced fluids enter one (1) 400 barrel settling tank (T03) where the fluids settle out as either condensate or produced water. The produced water goes to two (2) 400 barrel produced water tanks (T01, T02) and the condensate goes to two (2) 400 barrel condensate tanks (T04, T05). Flashing only occurs at the settling tank as the fluids stabilize in the settling tank before going to the other storage tanks. All five (5) tanks are connected to a vapor recovery unit (C-07) where tank vapors are collected and recycled back into the gas system right before the initial filter scrubber. There is a second vapor recovery unit (C-08) that is used as a back-up control for the storage tanks. The produced fluids are trucked out via tanker trucks as needed (EPLOR). The production is 150 barrels per day of condensate and 45 barrels per day of produced water.

Two (2) natural gas microturbine generators, each rated at 200 kWe supply power to the facility (GEN1 – GEN2). Likely, the total generator capacity of 400 kWe will not be operating at 8,760 hours per year, however, emissions were calculated as such for maximum flexibility. Fugitive emissions from component leaks and emissions from venting or blowdown events also occur.

There will also be five (5) small storage tanks (1,000 gallon each) onsite.

## SITE INSPECTION

A site inspection was conducted on February 16, 2016 by Doug Hammell of the DAQ Enforcement Section. According to Mr. Hammell, the facility was operating in compliance.

Latitude: 39.192491  
Longitude: -80.886737

Directions to the facility are as follows:

*From Pullman, drive east on Harrisville-Pullman Oxford Road for 4.3 miles. Turn right into Possum Run Road and follow for 0.8 miles to the facility entrance.*

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this application consist of compressor blowdown and startup events. The emissions from these events were estimated using the number of events per year and the amount of gas vented per event.

The total facility PTE (including fugitives) for the White Oak Compressor Station is shown in the following table:

Pollutant	R13-3002B PTE (tons/year)	R13-3002C PTE (tons/year)	PTE Change (tons/year)
Nitrogen Oxides	63.51	63.51	0
Carbon Monoxide	63.70	63.70	0
Volatile Organic Compounds	59.25	68.61	9.36
Particulate Matter-10/2.5	13.76	13.76	0
Sulfur Dioxide	0.47	0.47	0
Total HAPs	12.23	12.44	0.21
Carbon Dioxide Equivalent	103,137	103,953	816

The emissions increase is attributable to the number of compressor blowdown events increasing from 312 events per year at 2,342 standard cubic feet (scf) of gas per event to 832 events per year at 2,342 scf of gas per event. Additionally, there will be 832 compressor startup events per year at 1,050 scf of gas per event.

## REGULATORY APPLICABILITY

No new regulations apply to this facility as a result of this Class II Administrative Update request. The regulatory analysis conducted during the review of R13-3002B still applies.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There are negligible hazardous air pollutants (HAPs) associated with this Class II Administrative Update request. The toxicity analysis conducted during the review of R13-3002B still applies.

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at [www.epa.gov/iris](http://www.epa.gov/iris).

## AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) or 45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment) as shown in the table listed in the Regulatory Discussion section under 45CSR14/45CSR19.

## SOURCE AGGREGATION

“Building, structure, facility, or installation” is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

The Source Determination Rule for the oil and gas industry was published in the Federal Register on June 3, 2016 and will become effective on August 2, 2016. EPA defined the term “adjacent” and stated that equipment and activities in the oil and gas sector that are under common control will be considered part of the same source if they are located on the same site or on sites that share equipment and are within ¼ mile of each other.

The White Oak Compressor Station will operate under SIC code 4923 (Natural Gas Distribution). There are other compressor stations operated by Antero that share the same two-digit major SIC code of 49 for natural gas distribution. However, this compressor station is not located on “contiguous or adjacent” property.

“Contiguous or Adjacent” determinations are made on a case by case basis. There are other equipment and activities in the oil and gas sector that are under common control of Antero that are located on the same site or on sites that share equipment and are within ¼ mile of each other. The Yolanda Pad and Lockhart Heirs Pad are within ¼ mile of the White Oak Compressor Station. However, these two (2) pads operate under a SIC code of 13.

The White Oak Compressor Station is located on contiguous or adjacent properties with other facilities under common control, however, they do not operate under the same industrial grouping. Therefore, the emissions from this facility shall not be aggregated with other facilities for the purposes of making Title V and PSD determinations.

## MONITORING OF OPERATIONS

Antero will be required to perform the following monitoring and recordkeeping:

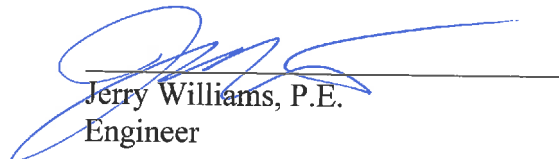
- Number of compressor blowdown events per year and gas vented per event.
- Number of compressor startup events per year and gas vented per event.
- The records shall be maintained on site or in a readily available off-site location maintained by Antero for a period of five (5) years.

CHANGES TO PERMIT R13-3002B

Section 13     Increase the compressor blowdown and startup events from 312 to 832 per year.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that Antero meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the White Oak Compressor Station should be granted a 45CSR13 Class II administrative update for their facility.

  
Jerry Williams, P.E.  
Engineer

  
Date